proposing that the hub node connects each channel of the first group of one of the links to one channel of the second group of each of the links other than the one link.

29.   (Amended) A method of proposing a star communication network comprising:

proposing a hub node and a plurality of spoke nodes;

proposing links coupled between the hub node and the plurality of spoke nodes, each link being arranged to carry no more than W channels into the hub node and out of the hub node; and

proposing that the hub node connects each channel of a first one of the links to no more than two channels of a second one of the links through the hub node.

REMARKS

Responding to paragraph 1 of the Office Action, an Abstract has been added on a separate page appearing at the end of this Amendment.

Responding to paragraph 2 of the Office Action, the range of "i" has been added to claims 11 and 13. Regarding claims 14 and 16, those claims have been amended to point out that N and E can be any integer. There is no specific range of N and E required by the claims. Claim 23 has been amended as suggested.

Responding to paragraph 3 of the Office Action, spoke nodes have been added to claims 17-29.

Responding to paragraphs 4-5 of the Office Action, the subject matter of the various claims was commonly owned at the time any inventions covered by the claims were made.

Responding to paragraph 6 of the Office Action, the rejection of claims 11, 13, 14 and 16-29 under 35 U.S.C. 103(a) as being unpatentable over Yano (U.S. Patent No. 4,516,272) is respectfully traversed.

Regarding claim 13, the Examiner states that Yano fails to specifically disclose the feature of dividing the even number W of channels in each link into two sets, providing a star network configuration such that channel i on any link may be connected to channel w(i) on any other links, where w(i) = I + W/2, which is a simple network configuration algorithm and well known in the art, which can be easily adopted by one of ordinary skill in the art into the network of Yano to provide a specific network configuration as per request by design choice. The Examiner has not provided any reference teaching the concept omitted from Yano in any context, much less a star network of the type claimed. The examiner's assertion appears to be merely a hindsight application of the applicants' own teaching without any support in the prior art. As a result, claim 13 is allowable.

Regarding claims 14 and 16, each is limited to a multiplexed link. This type of link is neither taught nor suggested by Yano. The Yano Patent does not appear to include the word "multiplex" or any variation of that word. The examiner also has not cited any other reference teaching a multiplexed link in the claimed combination. Claims 14 and 16 are allowable on this basis alone. In addition, claims 14 and 16 are allowable for the reasons stated in connection with claim 13.

Claim 11 has been limited to a hub node h and spoke nodes being connected to the hub node by links each having a plurality of W channels going into the hub node h and out of the hub node h. Yano does not teach or suggest such an arrangement. As

described in connection with Figs. 3 and 5, Yano has a plurality of channels between nodes 8, but not between the nodes and terminals 3. As shown in Fig. 8a, there is a single input channel I11 (described in Fig. 5) and a single output channel O11 (described in Fig. 5) between node N1 and terminal T11. The other terminals also appear to have a single input channel and a single output channel.

The Examiner's contention described in connection with claim 13 also is respectfully traversed in connection with claim 11. Even if the Examiner's assertion about the algorithm being well known in the art were correct, no one of ordinary skill would attempt to use it in connection with the Yano apparatus, because Yano teaches only a single channel input and a single channel output between his nodes 8 and terminals 3. As a result, there would be no motivation or incentive to arrange a plurality of channels between a hub node and spoke nodes as claimed. For all the foregoing reasons, claim 11 is allowable over Yano.

Regarding claims 17-29, each of the independent claims has been limited to a hub node, a plurality of spoke nodes, and links coupled between the hub node and the plurality of spoke nodes, each link being arranged to carry a plurality of W channels into the hub node and out of the hub node. Yona does not teach or suggest any such arrangement. As pointed out in connection with claim 11, Yano teaches only a single input channel and only a single output channel between his nodes and terminals. Thus, there would be no motivation or incentive to group, divide or connect the channels as claimed.

Responding to paragraph 7 of the Office Action, the Examiner's statement that claims 12 and 15 would be allowed if rewritten in independent form is gratefully

acknowledged. Claim 12 has been rewritten as new claim 30 and claim 15 has been rewritten as new claim 31. These claims are in condition for allowance.

As a result, it is believed that all claims now pending in this application, claims 11, 13-14, and 16-31 are in condition for allowance, and such action is respectfully solicited.

Date: <u>January 23, 2003</u>   Respectfully submitted,

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ABSTRACT OF THE DISCLOSURE

A star communication network including a hub node (102) and links (102E) coupled to the hub node for carrying data along routes in W channels. The hub node has switches connecting each channel of a first one of the links to various channels of a second one of the links through the hub node.

Kindly amend claims 11, 13, 14 and 16 as follows:

11.   (Amended) In a star network having a plurality of N nodes interconnected by a plurality of links, with one of [said] the nodes being the *hub* node h and the other [said] of the nodes being $\{x_1,\ldots,X_{N-1}\}$ [, referred to as the] *spoke nodes[, and being]* connected to [said] the hub node by [one of said] links each having a plurality of W channels going into the hub node *h* and out of the hub node h, where W is even, a method of configuring [said] the nodes[, said method] comprising:

(a)   dividing the channels into two sets, with each set having W/2 channels, where the first set has channels numbered $\{0,\ldots,W/2-1\}$ and the second set has channels numbered $\{W/2,\ldots,W-1\}$; and

(b)   configuring [said] the hub node such that channel *i* on any one of [said] the links may be connected to channel *w(i)* on any of [said] the links, where *w(i)* equals i + W/2 and where i is no greater than W.

13.   (Amended) In a star network having N nodes with one of [said] the nodes a hub node, wherein each of the other of [said] the nodes is connected to [said] the hub node by a multichannel link having W channels, where W is an even integer, a star network configured as follows:

[said] the hub node configured such that channel i on any of [said] the links may be connected to channel *w(i)* on any other of the links, where *w(i)* = (i + W/2) and where i is no greater than *W*.

14.   (Amended) In a network consisting of N nodes and E links e_1, e_2, ...e_E, wherein N and E are any integer and wherein each link between nodes is a multichannel multiplexed link, consisting of W channels $\{0,\ldots,W/2-1\}$, where W is even, a method of configuring the nodes in the network[, said method] comprising:

(a) grouping channels into two sets, $\{0,\ldots,W/2-1\}$ and $\{W/2,\ldots,W-1\}$; and

(b) at each node, for $i = 0, 1, \ldots, W/2 - 1$, connecting channel i on one link to channel $w(i)$ on all the other links incident on that node, where $w(i) = i + W/2$.

16.   (Amended) A network having N nodes and E links for interconnecting [said] the nodes where N and E are any integer, where each link is a multichannel multiplexed link having W channels, and where W is even, a network configured as follows:

each node, for $i = \{0,\ldots,W/2-1\}$, channel i on one incident link connected to channel $w(i)$ on all other incident links of [said] each node, where $w(i) = i + W/2$.

17.   (Amended) In a star communication network comprising a hub node and a plurality of spoke nodes and comprising a plurality of links coupled [to said] between the hub node and the plurality of spoke nodes, each link being arranged to carry a plurality of W channels into the hub node and out of the hub node [for carrying data in W channels along routes], a method of configuring [said] the network comprising the steps of:

limiting [said] the W channels to an even number;

dividing [said] the W channels into a first group and a second group in each of [said] the links;

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connecting each channel of [said] the first group of one of [said] the links to one channel of [said] the second group of each of [said] the links other than [said] the one link; and

assigning no more than W channels to the transmission of data along any of [said] the links, whereby the efficiency of the configuring is improved.

18. (Amended) A method, as claimed in claim 17, and further comprising the step of assigning [said] routes to [said] the channels which traverse at most two of [said] the links.

19. (Amended) A method, as claimed in claim 17, wherein [said] the step of connecting comprises the step of connecting each channel $i = 0, 1, ..., W/2 - 1$ of a first one of [said] the links through [said] the hub node to channel $w(i)$ on each of [said] the links other than [said] the first link where $w(i) = i + W/2$.

20. (Amended) A star communication network comprising in combination:
a plurality of spoke nodes;
a hub node; and
links coupled [to said] between the hub node and the plurality of spoke nodes, each link being arranged to carry a plurality of W channels into the hub node and out of the hub node, the channels being [for carrying data along routes in W channels] divided into a first group and a second group where W is even, [said] the hub node [comprising switches] connecting each channel of [said] the first group of one of [said] the links to one channel of [said] the second group of each of [said] the links other than [said] the one link.

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21.   (Amended) A network, as claimed in claim 20, wherein each [said] link comprises no more than W channels.

22.   (Amended) A network, as claimed in claim 20, comprising routes arranged to carry the W channels, wherein [said] the routes traverse at most two of [said] the links.

23.   (Amended) A network [Apparatus], as claimed in claim 20, wherein each channel i = 0,1,..., W/2 − 1 of [said] the one link is connected through [said] the hub node to channel w(i) on all of [said] the links other than [said] the one link where w(i) = i + W/2.

24.   (Amended) In a star communication network comprising a hub node and a plurality of spoke nodes and comprising links coupled [to said] between the hub node and the plurality of spoke nodes, each link being arranged to carry a plurality of W channels into the hub node and out of the hub node [for carrying data in W channels], a method of configuring [said] the network comprising the steps of:

assigning no more than W channels to the transmission of data along any of [said] the links; and

connecting each channel of a first one of [said] the links to no more than two channels of a second one of [said] the links through [said] the hub node, whereby the efficiency of the configuring is improved.

25.   (Amended) A star communication network comprising in combination:

a plurality of spoke nodes;

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a hub node; and

links coupled [to said] between the hub node and the plurality of spoke nodes, each link being arranged to carry a plurality of W channels into the hub node and out of the hub node [for carrying data along routes in no more than W channels], [said] the hub node [comprising switches] connecting each channel of a first one of [said] the links to no more than two channels of a second one of [said] the links through [said] the hub node.

26. (Amended) In a star communication network comprising a hub node and a plurality of spoke nodes and comprising links coupled [to said] between the hub node and the plurality of spoke nodes, each link being arranged to carry a plurality of no more than W channels into the hub node and out of the hub node [for carrying data in W channels], a method of configuring [said] the network comprising the steps of:

assigning no more than W channels to the transmission of data along any of [said] the links; and

connecting each channel of a first one of [said] the links to no more than a second channel of a second one of [said] the links through [said] the hub node, where the second channel is different from the first channel of the second one of [said] the links.

27. (Amended) A star communication network comprising in combination:

a plurality of spoke nodes;

a hub node; and

links coupled [to said] between the hub node and the plurality of spoke nodes, each link being arranged to carry a plurality of no more than W channels into the hub

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node and out of the hub node [for carrying data along routes in no more than W channels], [said] the hub node [comprising switches] connecting each channel of a first one of [said] the links to no more than a second channel of a second one of [said] the links through [said] the hub node, where the second channel is different from the first channel of the second one of [said] the links.

28.   (Amended) A method of proposing a star network comprising:

proposing a network comprising a hub node and a plurality of spoke nodes;

proposing links coupled [to said] between the hub node and the plurality of spoke nodes, each link being arranged to carry a plurality of W channels into the hub node and out of the hub node, the [for carrying data along routes in W] channels being divided into a first group and a second group where W is even; and

proposing that [said] the hub node [comprise switches connecting] connects each channel of [said] the first group of one of [said] the links to one channel of [said] the second group of each of [said] the links other than [said] the one link.

29.   (Amended) A method of proposing a star communication network comprising:

proposing a hub node and a plurality of spoke nodes;

proposing links coupled [to said] between the hub node and the plurality of spoke nodes, each link being arranged to carry no more than W channels into the hub node and out of the hub node [for carrying data along routes in no more than W channels]; and

proposing that [said] the hub node [comprise switches connecting] connects each

channel of a first one of [said] the links to no more than two channels of a second one of

[said] the links through [said] the hub node.